

AMENDMENTS TO THE SPECIFICATION:

The present Amendment has been prepared in accordance with a revised format established by the U.S. Patent and Trademark Office, as permitted in the Pre-OG Notice entitled "Amendments in a Revised Format Now Permitted."

Please amend the title of the invention as follows:

IMAGE PICKUP APPARATUS THAT SUITABLY ADJUSTS A
FOCUS

Please amend the abstract of the disclosure on page 44 of the specification as follows:

The present invention provides an image pickup apparatus which comprises: first and second photoelectric conversion units each including a plurality of photoelectric conversion elements; an image forming unit that forms images viewed from different points on the plurality of photoelectric conversion elements included in each of the first and second photoelectric conversion units; a first holding unit for holding signals from the first photoelectric conversion unit, the first holding unit having at least the same number of capacitors as the number of the photoelectric conversion elements included in the first photoelectric conversion unit; a second holding unit for holding signals from the second photoelectric conversion unit, the second holding unit having at least the same number of capacitors as the number of the photoelectric conversion

Amend

elements included in the second photoelectric conversion unit;
wherein and a first common output line to which signals are read out
from the plurality of capacitors included in each of the first and
second holding units.

Please amend the paragraph beginning at page 9, line 23 of the specification
as follows:

Amend

The switches 304, 306 to 308, 311, 314 to 317, and 322, 323
322 to 325 are turned on and off under the control of a shift register
and a decoder. ~~FIG. 1~~ FIG. 2 shows the arrangement of the pixels
309 in three ~~lines~~ rows and two ~~rows~~ columns, but actually, a large
number of pixels are arranged. Moreover, the pixels 309 should not
necessarily be arranged in a matrix but may be arranged in a form of
a honeycomb or the like.

Please amend the paragraph beginning at page 10, line 22 of the
specification as follows:

Amend

If the switches 314, 322 are then turned on, the amplification
signals outputted to the vertical output ~~line 310~~ lines 310, 319 are
transmitted to the capacitors 312, 320. If the switches 314, 322 are
then turned off, the amplification signals are held in the capacitors
312, 320. The reset switch 306 is then turned on to reset the
potential of the floating diffusion 305.

Please amend the paragraph beginning at page 14, line 12 of the specification as follows:

44

By performing the above operations, ~~correlate~~ correlative reset noises and the like are subtracted from signals to thereby read out signals with a high ratio of S/N to the outside according to the present embodiment.

Please amend the paragraph beginning at page 18, line 26 of the specification as follows:

45

The brightness is determined according to the result of the photometry, and the system control and operation unit 9 controls the diaphragm iris 3 according to the determined brightness.

Please amend the paragraph beginning at page 20, line 9 of the specification as follows:

46

FIG. 8 is a diagram showing the structure of an image pickup area in the solid-state image pickup element according to the first embodiment of the present invention. FIG. 8 shows an image pickup area where a plurality of pixels that ~~has~~ have a photoelectric converting function ~~and is~~ are arranged in lines or in a matrix. In FIG. 8, a region 32 in an image pickup area 31 is used for distance measurement and image pickup, and the other region in the image pickup area 31 is used only for image pickup. According to the

Pl
Cm

present embodiment, each pixel in the region 32 is composed of a pixel whose photoelectric conversion element is divided into a plurality of parts (painted over with black in FIG. 8). Each pixel in the other region in the image pickup area 31 is composed of a pixel whose photoelectric conversion element is not divided.

Please amend the paragraph beginning at page 20, line 25 of the specification as follows. Also, please divide this paragraph into four paragraphs as shown below:

M

FIG. 9 shows a pixel whose photoelectric conversion element is divided into a plurality of parts. The photoelectric conversion element can be divided in a variety of ways: e.g., division by an apparatus such as a LOCOS, division by a light-shielding layer, and division by simply joining impurities forming the photoelectric conversion element. Photoelectric conversion elements ~~A401, B402~~ 401, 402 are provided for a microlens 400. That is, a plurality of photoelectric conversion elements are provided for one microlens. According to the present embodiment, a CMOS type solid-state image pickup element is supposed as the solid-state image pickup element. A transfer switch, a reset switch, a readout switch, a selection switch, a diffusion region, and so forth are omitted from FIG. 9.

FIG. 10 shows an example of an equivalent circuit in a pixel

unit. In FIG. 10, the respective one ends of a photoelectric conversion element ~~A501~~ 501 and a photoelectric conversion element ~~B502~~ 502 are connected to a gate of a source follower input MOS transistor 505 via a transfer MOS transistor ~~B504~~ 504. A drain of the source follower input MOS transistor is connected to a source of a selection MOS transistor 506. A source of the source follower input MOS transistor is connected to a vertical signal line 508. A drain of the selection MOS transistor 506 is connected to a power source 509. A reset MOS transistor 507 is used for resetting electric charges stored in the photoelectric conversion element. In the equivalent circuit of the present embodiment, a signal voltage is generated at the gate of the source follower input MOS transistor according to the electric charges stored in the photoelectric conversion element, and a source follower circuit amplifies the electric charges thereof, which are then read out by the vertical signal line 508.

FIG. 11 shows a pixel whose photoelectric conversion element is not divided. A photoelectric conversion element 601 is provided for a microlens 600. A transfer switch, a reset switch, a readout switch, a selection switch, a diffusion region, and so forth are omitted from FIG. 11.

FIG. 12 shows an equivalent circuit in a pixel unit. In FIG. 12, parts similar to those described in FIG. 10 are denoted by the

check

AM

same reference numerals. A pixel in a region that is used only for image pickup is different from a pixel in a region that is used for distance measurement and image pickup, in that the pixel has one photoelectric conversion element and one transfer MOS transistor. In FIG. 12, there are provided a photoelectric conversion element 701 and a transfer MOS transistor 703.

Please amend the paragraph beginning at page 25, line 19 of the specification as follows:

AS

In a pixel having the equivalent circuit shown in FIG. 10, if the transfer MOS transistor 503 reads out the results of the photoelectric conversion carried out by the photoelectric conversion element ~~A501~~ 501, and the transfer MOS transistor 504 then reads out the results of the photoelectric conversion carried out by the photoelectric conversion element ~~B502~~ 502, it is possible to separately read out the results of the photoelectric conversion carried out by the photoelectric conversion element ~~A501~~ 501 and the results of the photoelectric conversion carried out by the photoelectric conversion element ~~B502~~ 502 in the distance measurement. In the image pickup operation, the transfer MOS transistors 503, 504 are turned on at the same time to add and read out the results of the photoelectric conversion carried out by the photoelectric conversion elements ~~A501, B502~~ 501, 502.